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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,648	08/13/2001	Thomas H. Lee	035905/0104	6565

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EXAMINER	
WEISS, HOWARD	
ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 06/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/927,648	Applicant(s) LEE ET AL.	
	Examiner Howard Weiss	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-482* is/are pending in the application.

4a) Of the above claim(s) *1-98,106-448,451-455 and 467-474* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *99-105,449,450,456-466 and 475-482* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-482* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5,6,8&9* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Attorney's Docket Number: 035905/0104

Filing Date: 8/13/01

Continuing Data: CIP of 09/801,233 (03/06/01) which is a CIP of 09/745,125 (12/21/00) which is a CIP of 09/639,579 (8/14/00) which is a CIP of 09/639,702 (8/14/00) which is a CIP of 09/639,749 (8/17/00) which claims benefit of 60/279,855 (3/28/01)

Claimed Foreign Priority Date: none

Applicant(s): Lee et al. (Subramanian, Cleeves, Walker, Petti, Kouznetzov, Johnson, Farmwald, Herner)

Examiner: Howard Weiss

Election/Restrictions

1. The Applicants' election of Group I Species 11, Claims 99 to 105, 424 to 429, 450, 456 to 466 and 475 to 482, in Paper No. 11 is acknowledged. Because the applicants did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. In reference to dependent Claim 450, the Examiner has determined that there is no undue burden to examine independent Claim 449 (Group I Specie 21) along with Claim 450.

3. In reference to dependent Claims 424 to 429, the Examiner has determined that the inclusion of the claims from which these claims dependent (401 and 415 and their subsequent dependent claims) expands the limitations of the elected claims to include species which were not elected and, therefore, puts an undue burden upon the Examiner. Therefore, these claims will not be examined and are considered a non-elected invention.

4. Claims 1 to 98, 106 to 448, 451 to 455 and 466 to 474 are withdrawn from consideration as being for a non-elected invention. The Applicants are requested to cancel the non-elected claims as part of a complete response to this office action. Cancellation of the non-elected claims would not preclude the later filing of a divisional application on the non-elected invention(s) (please see 35 USC 120 and121).

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

6. Claims 101 to 105 are objected to because Claim 101 recites the limitation "two successive device levels" in Line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Initially, and with respect to Claims 101, 456, 462 to 464, 479 and 480, note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al., 227 USPQ 964 (CAFC, 1985)* and the related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process,

and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

> even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); In re Pilkington, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); Buono v. Yankee Maid Dress Corp., 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir. 1935).*

Note that Applicant has burden of proof in such cases as the above case law makes clear.

9. Claim 456 is rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Watanabe (U.S. Patent No. 5,091,762).

Watanabe shows all aspects of the instant invention (e.g. Figures 6) including a monolithic 3-D array of charge storage devices **77** with a plurality of planarized device levels **80**.

As to the grounds of rejection under section 103(a), how the device levels are planarized (either by CMP or some other means) pertains to intermediate process steps and does not affect the final device structure. See MPEP § 2113 which discusses the handling of "product by process" claims and recommends the alternative (§ 102 / § 103) grounds of rejection.

10. Claims 449 and 450 are rejected under 35 U.S.C. § 103(a) as obvious over Watanabe and Uochi et al. (U.S. Patent No. 6,028,326).

Watanabe shows most aspects of the instant invention (Paragraph 9 and Figure 7) except for the first layer of transition metal-crystallized silicon. Uochi et al. teach (e.g.

Figures 1) to use a layer of transition metal-crystallized silicon **12a** to produce a device with high mobility at low temperatures and shorter times (Column 1 Line44 to Column 2 Line 45). It would have been obvious to a person of ordinary skill in the art at the time of invention to use a layer of transition metal-crystallized silicon as taught by Uochi et al. in the device of Watanabe to produce a device with high mobility at low temperatures and shorter times.

11. Claims 458 to 463, 465 and 466 are rejected under 35 U.S.C. § 103(a) as obvious over Watanabe and Zhang (U.S. Patent No. 5,835,396).

Watanabe shows most aspects of the instant invention (Paragraph 9) except for the array containing four or more levels and the change storage device comprising a pillar diode, a pillar TFT EEPROM, a self aligned TFT EEPROM or a rail stack TFT EEPROM. Zhang teaches (e.g. Figure 15A) to have a device with 4 or more levels **500a-d** to produce a device with high memory density (Column 2 Lines 1 to 19). It would have been obvious to a person of ordinary skill in the art at the time of invention to have a device with 4 or more levels as taught by Zhang in the device of Watanabe to produce a device with high memory density. In reference to the change storage device comprising a pillar diode, a pillar TFT EEPROM, a self aligned TFT EEPROM or a rail stack TFT EEPROM, Watanabe states (Column 2 Lines 51 to53) that the invention is applicable to any type of memory device. This would encompass all the memory devices of the instant invention.

12. Claims 475 and 478 to 482 are rejected under 35 U.S.C. § 103(a) as obvious over Watanabe and Kub (U.S. Patent No. 6,153,495).

Watanabe shows most aspects of the instant invention (Paragraph 9) except for the roughness being less than 4000 Angstroms. Kub teaches (Column 6 Lines 3 to 7) to have a roughness less than 4000 Angstroms for direct bonding of substrates together. It would have been obvious to a person of ordinary skill in the art at the

time of invention to have a roughness less than 4000 Angstroms as taught by Kub in the device of Watanabe for direct bonding of substrates together.

13. Claims 464, 476 and 477 are rejected under 35 U.S.C. § 103(a) as obvious over Watanabe and Zhang, as applied to Claim 458 above, and in further view of Kub.

Watanabe and Zhang show most aspects of the instant invention (Paragraph 11) except for the roughness being less than 4000 Angstroms. Kub teaches (Column 6 Lines 3 to 7) to have a roughness less than 4000 Angstroms for direct bonding of substrates together. It would have been obvious to a person of ordinary skill in the art at the time of invention to have a roughness less than 4000 Angstroms as taught by Kub in the device of Watanabe and Zhang for direct bonding of substrates together.

14. Claims 99 to 101 are rejected under 35 U.S.C. § 103(a) as obvious over Watanabe and Matsushita (U.S. Patent No. 5,998,808).

Watanabe shows most aspects of the instant invention (Paragraph 9) except for the monocrystalline semiconductor substrate. Matsushita teaches (e.g. Figure 1) to use a monocrystalline semiconductor substrate **101** to realize 3-D integrated circuit devices (Column 1 Lines 34 to 51). It would have been obvious to a person of ordinary skill in the art at the time of invention to use a monocrystalline semiconductor substrate as taught by Matsushita in the device of Watanabe to realize 3-D integrated circuit devices.

15. Claims 102 to 105 are rejected under 35 U.S.C. § 103(a) as obvious over Watanabe and Matsushita, as applied to Claim 99 above, and in further view of Zhang.

Watanabe and Matsushita show most aspects of the instant invention (Paragraph 14) except for the array containing four or more levels and the change storage

device comprising a pillar diode, a pillar TFT EEPROM, a self aligned TFT EEPROM or a rail stack TFT EEPROM. Zhang teaches (e.g. Figure 15A) to have a device with 4 or more levels **500a-d** to produce a device with high memory density (Column 2 Lines 1 to 19). It would have been obvious to a person of ordinary skill in the art at the time of invention to have a device with 4 or more levels as taught by Zhang in the device of Watanabe and Matsushita to produce a device with high memory density. In reference to the change storage device comprising a pillar diode, a pillar TFT EEPROM, a self aligned TFT EEPROM or a rail stack TFT EEPROM, Watanabe states (Column 2 Lines 51 to53) that the invention is applicable to any type o memory device. This would encompass all the memory devices of the instant invention.

Conclusion

16. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications. The official TC2800 Before-Final, **(703) 872-9318,** and After-Final, **(703) 872-9319**, Fax numbers will provide the fax sender with an auto-reply fax verifying receipt of their fax by the USPTO.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(703) 308-4840** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**.

18. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/74, 296	5/23/03
Other Documentation: none	
Electronic Database(s): EAST, IEL	5/27/03

HW/hw
27 May 2003

Howard Weiss
Patent Examiner
Art Unit 2814